***The Physics of Everyday Phenomena, 9e* (Griffith)**

**Chapter 1 Physics, the Fundamental Science**

1) People sometimes have difficulty distinguishing between scientific explanations of common events and other kinds of explanation (superstition, prejudice, magic, etc.). Which of the following best helps to identify a scientific explanation?

A) The explanation goes against the results of public opinion polls

B) The explanation changes according to the social status of the observer

C) We can test the explanation by comparing its predictions to measurement results

D) The explanation relies on local folklore

Answer: C

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

2) The main reason that physics is perceived to be difficult is because people think that

A) all of its concepts seem incompatible with our everyday experience.

B) it frequently changes its explanations of common occurrences.

C) the laws of physics are often shown to be wrong.

D) math is required to understand its ideas.

Answer: D

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

3) The metric system of units is based on which number?

A) 2

B) 8

C) 10

D) 16

Answer: C

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

4) Which of the following is a correct metric unit for volume?

A) Smidgens

B) Drops

C) Microns

D) Liters

Answer: D

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

5) A new system of units is invented where the basic unit of length is the "dak." The "dak" is defined as equal to 2 inches, and there are 2.54 centimeters in an inch. How many "daks" are there in a centimeter?

A) 4

B) 0.197

C) 2

D) 0.254

Answer: B

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

6) Suppose that, as it evaporates in the upper atmosphere, a raindrop's diameter changes from one millimeter to one micrometer. Its diameter has decreased by a factor of

A) 10, i.e., it is one tenth of the initial size.

B) 100, i.e., it is one hundredth of the initial size.

C) 1,000 (or, 103), i.e., it is one thousandth of the initial size.

D) 1,000,000 (or, 106), i.e., it is one millionth of the initial size.

Answer: C

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

7) Your new weed-cutter requires, as fuel, a gas-to-oil mixture of 20-to-1 (20 parts of gas mixed with one part of oil). You have 1/2 of a gallon of gas. How much oil, in gallons, should you add to make it all into fuel for the weed-cutter?

A) 2

B) 1/2

C) 1/20

D) 1/40

Answer: D

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

8) Students often fail to include units with their answers. Science teachers say that units are important. In which one of the following situations would you insist that units be included?

A) Your brother asks if you would like a large soda for lunch

B) A friend offers you two per mile to help pay for gas on a trip

C) Your manager says you can take a break when the project you are working on is halfway finished

D) A police officer says you did not stop at a red light

Answer: B

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

9) In which of these relations will S double if T is doubled?

A) S = 10T

B) T = 1/S

C) T = S\*S

D) S = 1/T

Answer: A

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

10) Physics is considered the "Fundamental Science" because

A) if a person understands physics, he or she does not need to know anything about other sciences.

B) physics offers the only exact explanations of how things work; other sciences only provide approximate answers.

C) it makes the most use of mathematics.

D) the ideas and concepts of physics are an important part of the foundation of other sciences.

Answer: D

Difficulty: 1 Easy

Topic: The Scope of Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

11) The development of physics concepts depends heavily on measurements because

A) measurements are needed to prove ideas true or false.

B) without measurements, we would not know what to explain with physics.

C) measurements involve mathematics.

D) physicists like numbers more than words.

Answer: A

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

12) The study of everyday phenomena allows us to

A) develop an understanding of the concepts used to describe more abstract concepts.

B) develop an appreciation of the physical universe around us.

C) develop our intuition and adjust our "common sense" to understand these phenomena.

D) All of these choices are correct

Answer: D

Difficulty: 1 Easy

Topic: Physics and Everyday Phenomena

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

13) A certain parcel of real estate is sold for 7.0 Mega dollars. What is the correct scientific notation for this selling price?

A) 7.0 × 106 dollars

B) 7 × 106 dollars

C) 70 × 105 dollars

D) 10 × 107 dollars

Answer: A

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

14) If a car travels at a constant speed, the distance the car travels in a certain time can be found using the relation d = st where d represents distance, s speed, and t time. This relationship can be expressed in words as

A) distance equals speed minus time.

B) multiply speed and time to obtain the distance traveled.

C) distance equals speed divided by time.

D) speed is the reciprocal of time and the inverse of distance.

Answer: B

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

15) If 2 people can knit a total of 12 socks per hour, how many socks can five people knit in an 8 hour work day?

A) 200

B) 240

C) 120

D) 36

Answer: B

Difficulty: 3 Hard

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

16) One inch is defined as 2.54 centimeters. The correct expression for a one-inch length, expressed in meters, is

A) 2.54 × 102 meters.

B) 2.54 × 101 meters.

C) 2.54 × 10-2 meters.

D) 2.54 × 10-1 meters.

Answer: C

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

17) It's well known that lightning strikes tall objects more frequently than short objects. Which of the following explanations of this phenomenon could be checked for validity?

A) Tall objects always contain more structural steel than short objects

B) Tall objects are always pointed at the top

C) Short objects do not attract lightning because they do not conduct electricity

D) All of these choices could be checked for validity

Answer: D

Difficulty: 2 Medium

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

18) Suppose a theory is used to make a prediction. A measurement is carried out to test the prediction. The measurement is found to have a value far larger than the prediction. This means

A) the theory must be completely incorrect and must be rejected entirely.

B) nothing because theories are not facts; theories often make incorrect predictions but are still regarded as true by scientists.

C) the measurement must be incorrect; theories by definition cannot be incorrect.

D) the theory might have correct elements but must be modified to account for some unforeseen influences.

Answer: D

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

19) By expressing relationships between quantities using mathematics, we can

A) describe the relationships more exactly; words cannot possibly describe a relationship.

B) avoid needing to be concerned with units.

C) make our statements more compact and make manipulations easier.

D) make understanding our ideas more comfortable for everyone, including nonscientists.

Answer: C

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

20) In order to gain a more scientific worldview, the student is encouraged to

A) perform simple experiments at home.

B) perform experiments, but only in the laboratory.

C) refrain from experiments; they are all too complicated.

D) consult the oldest books available.

Answer: A

Difficulty: 1 Easy

Topic: Physics and Everyday Phenomena

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

21) Which of the following is not a major subfield of physics?

A) Electricity and magnetism

B) Thermodynamics

C) Statistics

D) Optics

Answer: C

Difficulty: 1 Easy

Topic: The Scope of Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

22) A person claims that he can start fires by using his mental powers. If we start with the hypothesis that his claim is true, we can

A) put him in a room with just a newspaper and watch him start a fire.

B) do nothing; this is not a testable hypothesis.

C) make him explain how he starts fires with his mind.

D) watch a video of him starting a fire with his mind.

Answer: A

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

23) The study of rainbows would fall under what subfield of physics?

A) Mechanics

B) Thermodynamics

C) Optics

D) Electricity and magnetism

E) Atomic physics

Answer: C

Difficulty: 1 Easy

Topic: The Scope of Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

24) The key distinction between explanations provided by science and religion is

A) truth.

B) simplicity.

C) beauty.

D) testability.

Answer: D

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

25) The principal advantage of metric units over English units is that

A) metric units are of more convenient size.

B) conversions between metric units are easier.

C) metric units are more familiar.

D) there are fewer metric units to remember than English units.

Answer: B

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

26) Suppose you are told that the force on a body (F) is given by the product of its mass (m) and the acceleration of the body (a). Which of the following mathematical equations is the correct expression of this relationship?

A) F = m/a

B) F = m + a

C) F = a/m

D) F = m × a

E) F = 1/(m × a)

Answer: D

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

27) At night you get in your car to drive to the store. The car starts but none of the lights work. Which of the following activities would NOT be considered part of the scientific method?

A) Slam the hood down hard

B) Check the fuse in the light circuit

C) Check the wiring from the battery to the lights

D) Replace the light bulbs with new bulbs

Answer: A

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

28) A scout steps off a distance of 120 steps. If each step is 70 cm, what is the distance in meters?

A) 8.4 m

B) 84 m

C) 840 m

D) 8400 m

Answer: B

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

29) The metric unit most comparable in size to the English inch unit is the

A) micrometer.

B) millimeter.

C) centimeter.

D) meter.

E) kilometer.

Answer: C

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

30) Which of the following units is NOT appropriate for measuring volume?

A) Cup

B) Liter

C) Centimeter

D) Pint

E) Milliliter

Answer: C

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

31) If you start with the number 3.0 and move the decimal point one unit to the left, you wind up with 0.30. If you move the decimal point a total of five units to the left, the result is the same as that of dividing the original number by

A) 10.

B) 103.

C) 104.

D) 105.

Answer: D

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

32) The liter is a metric unit of volume. The U.S. customary unit of volume most nearly equal to the liter is the

A) quart.

B) cup.

C) teaspoon.

D) gallon.

Answer: A

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

33) Which of these is not important to the development of scientific explanations?

A) Measurement

B) Communication

C) Debate

D) All of these choices are important

Answer: D

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

34) Two different hypotheses are developed to explain why balls bounce. Experiments using basketballs show each hypothesis works equally well. To decide which one is more likely to be correct, you could

A) find out which one was developed by the more educated person.

B) use the one that involved more mathematics.

C) ask three physicists and choose the hypothesis that got the most votes.

D) try an experiment using baseballs.

Answer: D

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

35) When a scientist wants to strengthen a theory, she can make predictions of measurable events. The theory becomes stronger when

A) the theory is voted upon in a democratic process.

B) she and other scientists observe and measure the events, and they find that the events agree with the prediction.

C) her supervisor gives the prediction government funding.

D) the measurement process goes against the prediction, thereby proving the theory valid.

Answer: B

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

36) In order to avoid cooking disasters, a numerical recipe has an advantage over purely verbal directions. That is, verbal directions can become longwinded and put the cook at risk of distraction. On the other hand, a numerical recipe like "two parts water to one part rice"

A) is easily set to music.

B) is useful for any amount of rice, because it is a ratio.

C) is also useful in the periodic table of elements.

D) obeys Newton's three laws of motion.

Answer: B

Difficulty: 1 Easy

Topic: Physics and Everyday Phenomena

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

37) When trying to make sense of the universe, it is useful to study everyday physics of things you see in your hometown, even in your own kitchen, because

A) no one knows any of the physical principles that govern the universe outside our planet, Earth.

B) we expect the same laws govern physics in your hometown and everywhere else in the universe.

C) only astrology governs the planets.

D) when you finish, you can eat the experiment.

Answer: B

Difficulty: 1 Easy

Topic: Physics and Everyday Phenomena

Chapter: 01 Physics, the Fundamental Science

Type: Conceptual

Accessibility: Keyboard Navigation

38) The numerical factor 109 corresponds to what quantity?

A) A million

B) A billion

C) A millionth

D) A trillionth

Answer: B

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

39) Which of the following objects can you use to roughly visualize a length of 1 meter?

A) The diameter of a human hair

B) The length of an ant on the sidewalk

C) The length of a 2 liter bottle of soda pop

D) The height of a kitchen counter

E) The length of a football field

Answer: D

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

40) Scientists generally agree that global warming has resulted mostly from an increase in what substance in the atmosphere?

A) Nitrogen

B) Carbon monoxide

C) Carbon dioxide

D) Sulphur dioxide

Answer: C

Difficulty: 1 Easy

Topic: What about Energy?

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

41) The increase in the average atmospheric temperature for the entire planet Earth over the last few centuries can be explained by the

A) greenhouse effect.

B) increase in size of gaps in the ionosphere.

C) melting of the polar icecaps.

D) change in the average salt levels in the oceans.

Answer: A

Difficulty: 1 Easy

Topic: What about Energy?

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

42) Which of the following is not considered to be a fossil fuel?

A) Coal

B) Uranium

C) Natural gas

D) Crude oil

Answer: B

Difficulty: 1 Easy

Topic: What about Energy?

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

43) Historical measurements of the average surface temperature of the Earth have shown an accelerating pace since

A) 1850.

B) 1900.

C) 1940.

D) 1980.

Answer: D

Difficulty: 1 Easy

Topic: What about Energy?

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

44) Applications of semiconductor technology include

A) more powerful antibiotics.

B) photovoltaic cells.

C) efficient car batteries.

D) fossil fuel burning electric generators.

Answer: B

Difficulty: 2 Medium

Topic: The Scope of Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

45) The metric unit of length closest to our English mile unit is the \_\_\_\_\_\_\_\_.

Answer: kilometer

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

46) The distance around the earth at the equator is about 40,000 kilometers. This can be written as \_\_\_\_\_\_\_\_ mega meters.

Answer: 40

40.0

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

47) The subfield of \_\_\_\_\_\_\_\_ is the study of forces and motion.

Answer: mechanics

dynamics

kinetics

Difficulty: 2 Medium

Topic: The Scope of Physics

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

48) Four cars are required to take a group of 16 students on a trip. If there were 36 students to transport \_\_\_\_\_\_\_\_ cars would be needed.

Answer: 9

nine

9.0

Difficulty: 1 Easy

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation

49) After making observations and finding some rules as to how nature works, a scientist proceeds to make a(n) \_\_\_\_\_\_\_\_ to explain the observed rules.

Answer: hypothesis

theory

model

Difficulty: 1 Easy

Topic: The Scientific Enterprise

Chapter: 01 Physics, the Fundamental Science

Type: Definition

Accessibility: Keyboard Navigation

50) To prepare two servings of hot cereal, a cook mixes 1/3 cup of ground cereal with one cup of hot water. To prepare six servings will require \_\_\_\_\_\_\_\_ cup(s) of cereal and \_\_\_\_\_\_\_\_ cup(s) of hot water.

Answer: 1 and 3

1, 3

1; 3

Difficulty: 2 Medium

Topic: The Role of Measurement and Mathematics in Physics

Chapter: 01 Physics, the Fundamental Science

Type: Numerical

Accessibility: Keyboard Navigation